

Algebra 2

Unit 4: WS #17

PRACTICE EXERCISES



Use technology where appropriate.

Use the binomial theorem to expand each binomial.

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|-----------------|-----------------|-------------------|-------------------|
| 1. $(x + y)^5$ | 2. $(x - y)^5$ | 3. $(2x + y)^3$ | 4. $(x + 3y)^4$ |
| 5. $(x - 2y)^5$ | 6. $(2x - y)^5$ | 7. $(x - 3y)^4$ | 8. $(4x - y)^5$ |
| 9. $(x - 1)^7$ | 10. $(1 - x)^6$ | 11. $(x^2 + 1)^5$ | 12. $(y^2 + a)^4$ |

Find the specified term of each binomial expansion.

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|------------------------------------|----------------------------------|
| 13. Third term of $(x + 3)^{12}$ | 14. Fourth term of $(x + 2)^5$ |
| 15. Second term of $(x + 3)^9$ | 16. Third term of $(x - 2)^{12}$ |
| 17. Twelfth term of $(2 + x)^{11}$ | 18. Seventh term of $(x - 2y)^6$ |
| 19. Eighth term of $(x - 2y)^{15}$ | 20. Third term of $(3x - 2)^9$ |

Find the first three terms of each binomial expansion.

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|-------------------------|------------------------|----------------------|---------------------|
| 21. $(2x + 3)^{18}$ | 22. $(3x - 1)^{20}$ | 23. $(x^2 + y)^{12}$ | 24. $(x^2 - y^2)^8$ |
| 25. $(2x^2 + y^4)^{11}$ | 26. $(y^4 - x^3)^{11}$ | 27. $(2 + xy)^{15}$ | 28. $(3 - x^2y)^7$ |

Find the specified term of each binomial expansion.

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| 29. Seventh term of $(x^2 - 2y)^{11}$ | 30. Eighth term of $(x^2 + y^2)^{13}$ |
| 31. Sixth term of $\left(x - \frac{1}{2}\right)^9$ | 32. Seventh term of $\left(\frac{x}{3} - y\right)^{11}$ |
| 33. Fifteenth term of $\left(\frac{x}{9} + y^2\right)^{14}$ | 34. Eighth term of $\left(\frac{2x}{7} - \frac{y}{2}\right)^7$ |

The values of powers of some numbers can be approximated by using the first two terms of binomial expansion.

Example Approximate the value of $(1.015)^{20}$ by using the first two terms of a binomial expansion.

$$\begin{aligned}(1.015)^{20} &= (1 + 0.015)^{20} = 1^{20} + 20(1)^{19}(0.015) \\ &\approx 1 + 0.3 \approx 1.3\end{aligned}$$

Approximate each value to the nearest tenth using the first two terms of a binomial expansion.

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| 35. 1.04^5 | 36. 0.98^{10} | 37. 1.02^{20} |
| 38. 1.01^{50} | 39. 0.99^{30} | 40. 1.001^{200} |